

## CLAIMS

What is claimed is:

1. An apparatus for oxidative treatment of gaseous pollutants in a gas stream, said apparatus comprising a  
5 thermal reactor and an inlet for conducting said gas stream into said reactor, said inlet comprising a conduit terminating with a portion of said conduit within said reactor wherein said portion of said conduit is located within a tube which projects beyond the end of said conduit  
10 to define a chamber within said tube, said tube having an open end communicating with the interior of said reactor;  
said conduit further accommodating a secondary inlet for introducing other gases into said conduit.
2. An apparatus according to Claim 1, wherein said  
15 conduit is curved.
3. An apparatus according to Claim 1, wherein said conduit and secondary inlet are concentrically located.
4. An apparatus according to Claim 1, comprising a  
20 plurality of said inlets for introducing gas streams into said reactor.
5. An apparatus according to Claim 4, wherein there are different locations of secondary inlets among the conduits of said inlets.
6. An apparatus according to Claim 1, wherein said  
25 conduit accommodates three secondary inlets.
7. An apparatus according to Claim 1, wherein said conduit accommodates a secondary inlet for injection of a

compressed gas to provide process pressure control and to prevent flame flashback.

8. An apparatus according to Claim 7, wherein said conduit and secondary inlet are concentrically located.

5 9. A thermal reactor comprising a central chamber, heating elements, an entry end and an exit end of said chamber, a side inlet communicating with an exterior air space defined by an exterior wall and said heating elements, an interior air space communicating with said exterior air  
10 space, said interior air space defined by an interior wall and said heating elements, and an orifice in said interior wall for introducing air from said interior space into said central chamber.

15 10. An apparatus according to Claim 9, wherein said heating elements are annularly located around said chamber.

11. An apparatus according to Claim 9, wherein said heating elements are located within said chamber.

20 12. An apparatus according to Claim 9, wherein said exit end of said chamber accommodates an annular chamber with an open upper end, wherein liquid is forcibly introduced into said annular chamber to form a vortex which flows from said open upper end into said gas stream exiting said central chamber.

25 13. An apparatus for removal of particulates from a gas stream comprising:

a packed bed for trapping and condensing particles wherein said gas stream is upwardly flowed through

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said bed against downwardly flowing liquid and air inlets are provided for flowing air onto the upper portion of said bed to cool the upper portion of said bed to promote condensation and particle growth within said bed.

5           14. A scrubber for removing chemical pollutants in a gas stream comprising:

an inlet for introducing said gas stream into a scrubbing chamber, said scrubbing chamber containing coated packing in at least two vertically separated beds, said  
10 coating being adapted to entrap or react with said pollutants;

monitoring means for monitoring the amount of said pollutants being removed from said stream by said scrubber;

said monitoring means controlling selective  
15 introduction of a regenerative coating composition onto each of said beds to regenerate said coating on said packing.

20           15. A scrubber according to Claim 14 wherein said monitoring means comprises a detector for measuring the concentration of a pollutant in the gas exiting said scrubber.

16. A scrubber according to Claim 14 wherein said monitoring means comprises a timer to introduce said coating composition to said beds at predetermined intervals.

25           17. An apparatus for treatment of gaseous pollutants in a gas stream, said apparatus comprising:  
a thermal reactor comprising a central chamber, heating elements, an entry end and an exit end of said chamber, a side inlet communicating with an exterior air space defined by an exterior wall and said heating elements,

an interior air space communicating with said exterior air space, said interior air space defined by an interior wall and said heating elements, and an orifice in said interior wall for introducing air from said interior spacing to said central chamber;

at least one inlet for conducting said gas stream into said reactor, said inlet comprising a conduit terminating with a portion of said conduit within said reactor wherein said portion of said conduit is located within a tube which projects beyond the end of said conduit to define a chamber within said tube, said tube having an open end communicating with the interior of said reactor;

said conduit further accommodating a secondary inlet for introducing other gases into said conduit;

an annular chamber located at the exit end of said reaction chamber, said annular chamber having an open upper end wherein liquid is forcibly introduced into said annular chamber to form a vortex which flows from said open upper end into said gas stream exiting said central chamber;

a packed bed for trapping and condensing particles, wherein said stream is upwardly flowed through said bed against downwardly flowing liquid;

and air inlets for flowing air into the upper portion of said bed to cool the upper portion of said bed for further condensation and particle growth in said bed;

a scrubber for removing chemical pollutants in said gas stream comprising an inlet for introducing said gas stream into a scrubbing chamber, said scrubbing chamber containing coated packing in at least two vertically separated beds, said coating being adapted to entrap or react with said pollutants;

monitoring means for monitoring the amount of said pollutants being removed from said stream by said scrubber,

said monitoring means controlling selective introduction of a regenerative coating composition onto each of said beds to regenerate said coating on said packing.

18. An apparatus according to Claim 17, wherein  
5 said conduit is curved.

19. An apparatus according to Claim 17, wherein said conduit and secondary inlet are concentrically located.

20. An apparatus according to Claim 17, wherein  
10 said heating elements are annularly located around said chamber.

21. An apparatus according to Claim 17, wherein said heating elements are located within said chamber.

22. A method for scrubbing chemical pollutants in a gas stream comprising the steps of continuously introducing  
15 said gas stream into a scrubbing chamber, said scrubbing chamber containing coated packing in at least two vertically separated beds, said coating being adapted to entrap or react with said pollutants;

monitoring the amount of said pollutants being  
20 removed from said stream;

regenerating the coating on one of said beds while continuously flowing said gas stream through the other of said beds.